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WATER MANAGEMENT PROGRAM
FOR THE
RAWLINS DISTRICT
U.S.D.I. - BUREAU OF LAND MANAGEMENT

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I. INTRODUCTION

The Wyoming BLM State Water Management Program was approved in July, 1977. State policies, objectives, roles, program composition and responsibilities are presented in the program. The document provides the guidance necessary for the development of District Water Management Programs for all Districts in Wyoming.

The Rawlins District Water Management Program addresses the roles, policies, objectives, goals, and responsibilities necessary in management of the District's water resources. This document provides a permanent foundation for developing the water resources portion of the 4340 activity within the District. The appendices will address methodologies and program implementation and will be updated annually to reflect changes in District priorities. The entire document will be used as an aid in developing the AWP and program packages.

II. ROLES

This section describes the role of the Water Management Program within the overall operation of the Resource Management Program in the Rawlins District. The Water Management Program consists of seven major roles (from Section IV of the State Program) to be performed by Hydrologists and Watershed Scientists.

A. Water Management is concerned primarily with the application of the science of hydrology to the water resources of small to intermediate drainage basins on public lands.

B. Water Resource Investigations consititute inventories of water quality and quantity information from which to evaluate management activities. This information will also be used to predict the effects of proposed management activities on the water resource.

C. Flood Hazard Evaluation and Disaster Surveys describe the potential flood hazard to management activities on flood plains and describe the kind and amount of damage sustained to watershed values as a result of fire, flood, or other disasters. The program should also identify action necessary to restore lost water resource values.

D. Water Quality Management involves formulating best management practices (BMP's) consistent with water quality objectives. This is accomplished through the Bureau Planning System (BPS) and coordination with local, State and other Federal agencies.

E. Small Watershed Studies are needed in the evaluation of land treatments on the water resource. These effects will complement the activities of the water resource investigations.

F. Internal Coordination in the use and application of water resource information will be accomplished by district or area workshops, slide presentations, on-the-ground instruction and other methods. Every effort will be made to transform technical data into understandable information for the user.

G. External Coordination with local, State, and other Federal agencies, industry and contract representatives to avoid duplication of effort, and to identify opportunities for enhancement, improvement, or protection of the water resource.

II. POLICIES

A. The State Water Management Program establishes State policies regarding the water resource. A summary of these include:

1. Assure that multiple-use and sustained-yield, as related to the water resource, are basic goals for land use planning and management of public lands.

2. Protect, maintain, restore and/or enhance the quality of water on all public lands.

3. Collect and maintain water resource data.

4. Comply with all laws, Executive Orders, and regulations.

B. The Rawlins District policies formulate some of the procedures for complying with the State policies. The following are policies of the Rawlins District:

1. Summarize and interpret, annually, water resource data collected by or for the District and maintain this information in permanent files.

2. Support a continuing water resource inventory to provide basic data for District programs and activities. These data will be stored in Water Resources Research Institute's "Water Resources Data System" located in Laramie, Wyoming

or in other data storage-retrieval systems as identified in the State Water Management Program.

3. Collect water resources information and conduct special studies to meet year to year goal accomplishments of the District Water Management Program outlined in the Appendices.

4. Assure that proper consideration of the water resource is made in all management decisions. The District Hydrologist or Assistant District Hydrologist will actively participate in formulating or reviewing Environmental Assessment Reports. He will make recommendations for the construction and maintenance of watershed projects, activity and project plans, compliance activities, and all other water related activities.

5. Participate with local, State, and Federal planning organizations for the development of plans and actions affecting the water resource.

6. Develop, coordinate, and implement Watershed Activity plans to enhance the water resources.

IV. OBJECTIVES

In the past, the water resource portion of the 4340 activity has operated primarily as a support to other resources, but this support activity usually did not have adequate data to make the kinds of input needed and was provided inconsistently. It is important that managers and other resource specialists understand what input the hydrologist and the water resource program as a whole can provide to their specific needs. The objectives of this program will be to meet the objectives outlined on page 8 of the State Water Management Program and these additional objectives for the Rawlins District.

A. To provide technical guidance and expertise to the District Manager, Area Managers, and Division and Branch Chiefs in understanding and building a viable water resource program for incorporation into the land management program.

B. To provide a sound basis for addressing water resource in environmental assessment, the bureau planning system, activity plans, program packages, Annual Work Plan development, and project planning.

C. To comply with local, State, and Federal laws, regulations, executive orders, and BLM directives pertaining to the water resource.

D. To assure continuity in the District water resource program over a number of years by establishing goals and priorities for the accomplishment of the program.

E. To have a good working relationship with other local, State, and Federal agencies which may have plans or actions affecting water resources on public lands within the Rawlins District.

V. GOALS

In order to obtain the long range objectives presented in this document, it is necessary to establish goals and timetables for accomplishments.

A. Training and Guidance

The following activities will be conducted to provide training and guidance to the District.

1. Water resource topics (eg. slide shows, demonstrations) will be presented at staff meetings, all employee meetings, (at least once a year), and workshops.

2. Assure that water resources concerns are addressed in all other Resource and Operations activities (i.e., EAR's, staff reports).

3. Supervisors will be kept continually informed of the current status concerning water resources.

4. Hydrologists will keep themselves and supervisors informed of existing and new laws, regulations, executive orders, manual releases, and instructional memoranda, and how they relate to the water resources and land management.

B. Level II Reconnaissance Survey

The level II Reconnaissance Survey is described in the State Water Management Program and includes an analysis of all

existing information supported by short term, low intensity field sampling. The short term data includes the following:

1. Intermittent grab sampling for water quality.
2. Intermittent flow measurements.
3. Short term climatic data.
4. Stream condition surveys.
5. Compilation of pertinent hydrologic studies.
6. Groundwater inventory

A Level II Reconnaissance Survey is necessary for preparation of the Unit Resource Analysis, (URA) and the identification of areas where more detailed information is needed. Therefore, each Planning Unit of the Rawlins District will be covered by Level II Surveys and these will be incorporated into the URA's. Details of Level II are in Appendix A.

C. Long Term Data Network

This network will normally be used on large drainage areas to determine if regional changes to the water resource are occurring within the District. This data network is essential in providing accurate data for long term evaluations. Information from Level II Reconnaissance Surveys is necessary to design the Long Term Data Network for both surface and ground water. Details on the setup of the network are in Appendix B.

D. Special Studies and Monitoring

Often Level II Reconnaissance Surveys and the Long Term Data Network are inadequate to assess future impacts of projects or to evaluate results of projects. In these situations a special study or monitoring program is necessary. Activities which would result in these special studies are:

1. Major EARs and ESs, both before the action to predict impacts, and afterward to assess the actual effects of the action and to determine the effectiveness of implemented mitigating measures. An example would be in assessing different grazing management schemes since studies have not actually addressed the impact of these schemes on water resources with more than models.
2. Water right studies and instream flow requirement studies.
3. Efforts to assess after effects of natural phenomena, or to design safeguards from such events.
4. Other actions which are not assessable with available information.
5. Implementation of the MFP through activity plans often necessitates additional water resource surveillance, both before and after implementation.

Appendix C identifies areas requiring special surveillance and monitering.

E. Coordinate District Efforts with Other Local, State, and Federal Agencies

It is necessary that the Rawlins District have input into Actions by other agencies that may effect water uses and quality on BLM managed lands. The agencies include, but are not limted to:

1. Local 208 water quality planning agencies for the development and implementation of best management practices mandated by P. L. 95-217, Sec. 208.
2. Wyoming State Engineer concerning water rights.
3. Wyoming Department of Environmental Quality and EPA concerning water quality rules and regulations.
4. The U. S. Forest Service for development of watershed plans in areas adjoining National Forests.
5. The U. S. Geological Survey, Water Resources Division, on water monitoring efforts.
6. Local and State government concerning the management of critical or community watersheds.

VI. RESPONSIBILITIES

To have a workable program, responsibilities of District personnel must be identified.

A. District Manager and Area Managers

The DM is ultimately responsible for all programs conducted within the District. The AM's are responsible to the DM for programs conducted in their respective areas. These managers, therefore, have the final responsibility of ensuring that the Water Management Program is implemented.

B. Division of Resources

1. The Chief, Division of Resources responsibilities in the water management program will be to provide technical support to the resource areas and Division of Operations. He will ensure consideration of the water resource program in a multiple use context. He also occupies the key role in coordinating the District Water Management Program, providing training as required, and compiling the District AWP and inventory systems.

2. District Hydrologist

   a. Reviews or prepares the Water Management Program input for the AWP, and other projects assigned to the Division of Resources.

   b. Coordinates within the District the implementation of the Water Management Program.

   c. Provides water resource input and advice on all bureau and non-bureau actions which directly or indirectly affect the water resource.

   d. Supervises and/or conducts special studies, surveys, and investigations. This may include contracts or cooperative agreements with private or governmental entities.

   e. Coordinates water resource studies, investigation, or plans with other local, State and Federal agencies.

   f. Provides management with recommendations for water resource staffing needs and necessary qualifications.

g. Provides training, information, and technical guidance to resource specialists, line managers, and assistant hydrologists.

h. Annually reviews and monitors the District Water Management Program.

i. Collects, analyzes, and interprets water resource data in accordance with program directives in cases where inventories are assigned to the Division of Resources.

j. Is responsible for data storage and retrieval, and maintaining water resources reference material in the District library.

3. Assistant District Hydrologist

   a. Prepares the water resources portion of planning system updates and assigned EAR's and ES's. Many EAR's may be prepared within the resource areas, and those that are shall be reviewed to ensure incorporation of water resources data.

   b. Is responsible for planning, coordination, and conducting Level II Reconnaissance Surveys within the District.

c. Coordinates compliance with the Drinking Water Standards and Floodplain Management within the District.

d. Provides water resource interpretations to all other projects assigned to the Division of P. and E.A.

C. Division of Planning and Environmental Analysis

1. The Chief, Division of Planning and Environmental Analysis, responsibilities in the water management program will be to provide water resources input into the planning system and ensure incorporation into EAR's and ES's.

D. Resource Areas

1. Area Hydrologist

When an area has a hydrologist, he will have most of the District Hydrologist's responsibilities, but at the area level. This would include the following:

a. Developing the Area submission for AWP and doing environmental assessment, activity plans, and project plans that are within the Resource Area.

b. Collecting and analyzing data when inventories are to be carried out at the Resource Area level.

c. Being responsible for coordinating the Water Management Program in the Resource Area.

d. If the area does not have a Hydrologist or Watershed Specialist the Area Manager will designate one individual to function as the area water resources contact.

E. Division of Operations

1. Chief of Operations

a. Identifies to the District Manager and/or Area Manager the need of water resource input for new construction or maintenance of watershed projects and all other projects which directly or indirectly affect the water resource.

b. Files water rights, and coordinates water quality sampling of Bureau maintained public drinking water facilities with Area Managers and the Chief of Resources.

c. Assures compliance with all water resource related laws, regulations, and stipulations regarding oil and gas activity.

VII. SUMMARY

The Rawlins District Water Management Program is intended to provide guidance for land managers and field specialists in order that water management will be properly considered in Bureau program planning and implementation. The program involves the application of the science of hydrology as a component of the BLM watershed activity. It is concerned with water availability and quality, watershed characteristics, climate, water legislation, water rights, and special studies to support Bureau activities.

The objectives of the program are to inventory, provide information and analyses to management, ensure BLM compliance with applicable laws, coordinate BLM water related activities with other groups, and foster an understanding of the importance of water resource considerations. Major inventories (and other activities) will normally be developed and supervised at the Division of Resources level. However, these procedures provide for activities to be completed at either the division or resource area level.

The preceeding portion of the Water Management Program is the basic program which provides the general outline of the program. This outline is not expected to change significantly with time, but the appendices, which follow, are dynamic and will change over time. Appendices will describe methods to be used, timetables of implementation, and outline priorities which will be updated to comply with program, policy, and development needs. New appendices may be added or old ones deleted as the need may arise.

VIII. APPENDICES

APPENDIX A. Level II Water Reconnaissance Survey

This appendix will outline methods of conducting Level II Surveys, and sources of information as well as priorities of areas within the District.

1. Review and summarize all existing hydrologic data and surveys.

   Many agencies have collected or stored water resources data. These agencies include WRRI, USGS, DEQ, EPA, NOAA SCS, SEA (former ARS), Wyoming State Engineer, USFS, and BLM.

   If a base map of the area does not exist, one should be prepared, usually on ½ inch to the mile surface management quads. Streams and drainage basins that satisfy the following criteria should be identified on the base map:

   a. Drainage basins which have perennial streams and include greater than 30% public land.

   b. All drainage basins which have greater than 50% public lands and are larger than 10 square miles.

2. Surface Water

   a. Overlay

      An overlay should be made to identify all existing sites for which data exists (discharge or qualtiy). To this overlay any new sites sampled during the Level II Survey will also be identified.

   b. Reference Points

      When a sampling site is established, a reference point is to be placed so that the same site can be sampled in

the future. A fence post or other such marker is adequate. Such a permanent marker will ensure the variations due to differences in locations will be kept to a minimum. A photo of each site will be taken. They will be helpful in finding sampling sites at later dates, and for noticing any changes in stream characteristics.

c. Streamflow Measurements

A streamflow measurement is to be made at each site whenever a grab sample for water quality is taken. Water quality measurements without an idea of what discharge was at the time are nearly useless in an area of highly variable streamflows. Besides making discharge measurements with flow meters, other measurements can be taken to enable use of certain probability relationships and flow estimation equations. These include active channel width measurements for use in determining mean annual flows, and peak flows. This method is described in the U.S.G.S. Water-Resource Investigations No. 76-112.

All flow data, as well as quality analysis will be stored on the Water Resources Data System (WRDS) at University of Wyoming. Some of the data collected by BLM may not be incorporated into WRDS and will be stored in BLM files.

Other channel geometry measurements which can be used in certain relationships are channel profile, slope of flood plain and channel slope. An estimation of Manning's "n" should be made for flood plains and streambed.

d. Water Quality Grab Sampling

Water quality sampling for a Level II Survey would be a periodic type of sampling. Water quality indicators that should be measured at each site include pH, temperature, dissolved oxygen, conductivity, turbidity, and in some cases, coliform bacteria. The Rawlins District has the equipment necessary to make all the measurements mentioned so far. For further analysis of water quality anions, cations, sediment content, total dissolved solids, trace metals, and radiochemicals a commercial laboratory analysis is necessary. Since determination of major anion and cation levels, TDS and sediment is often necessary information for the types of interpretations needed; a contract will usually need to be negotiated for each Level II Survey. There are several laboratories in Casper which can do the types of analysis needed. Other labs include the State Department of Agriculture in Laramie and Western Wyoming College in Rock Springs. Generally, use of labs farther away would be inappropriate because of time delays, but use of these labs may be necessary if radiochemical or trace metal analysis is desired.

3. Groundwater

a. Overlay

On a separate overlay, groundwater sampling sites (quality yield, depth, etc.), will be identified. The overlay can also be used to show expected potentiometric surface, recharge areas, and areas of either good or poor quality

groundwater. The Hydrologic Atlases on Groundwater Reconnaissance may be the first general source of such existing information. Most of the Rawlins District is covered by these Atlases.

b. Parameters to be Sampled

Some characteristics to be measured or sampled at groundwater sites would include, depth to water, yield, pH, temperature, TDS, major anions and cations and coliform bacteria at springs. Since springs are fed by groundwaters, they will be covered by the groundwater portion of the Level II Survey.

c. Form WSO 7316-1, 1a and 1b

The form developed for well site investigation is a good method of summarizing the data gained from the groundwater investigation.

4. Climatological Data

At the present time the only long term climatological data available is from U.S. Weather Bureau stations in towns and cities of the District. Due to differences in topography and other factors, this data does not always present the true situation in outlying areas. Because of this, it is desirable to get more localized climatological data for Level II survey areas. This would include precipitation, temperature, and humidity. In some cases wind information may also be necessary.

Recording equipment which is serviced weekly would be the most desirable monitoring equipment.

Other sources of climatological data include the WRRI "WRDS" system. Also Herb Fisser of the University of Wyoming has made quarterly precipitation measurements in the Red Desert area over a period of time in conjunction with Range studies. Another source is from mining companies, as they sometimes set up climatological stations to aid in preparing Environmental Reports and other such reports.

5. Priority of Implementation

Level II Reconnaissance Water Surveys will be mostly related to the URA updates within the District. Although at times a particular watershed may need to have the Survey due to other activities which may occur before a URA update is scheduled for the watershed. It must be emphasized that in no way are these a one time survey, but for best results and data they must be continued indefinitely. Of course the continued monitoring would be at a lower intensity than it will be during the first stage of the survey.

The Level II Reconnaissance Water Survey would begin the spring of the fiscal year before the fiscal year slated for completion of the URA. Thus, two spring seasons, two summers, and one fall and winter (baseflow period) of data would be collected.

The schedule for the Level II surveys will closely follow URA updates. At the present time the schedule would be as follows:

1. Overland P.U. would start in 1980; this area is already started.
2. Hanna P.U. would start in 1981.
3. Shirley Mt. P.U. in 1983.
4. Below the Rim P.U. in 1984.
5. Albany, Laramie, and Dubois in 1985.

The man-months and funds for conducting the Level II Survey vary with planning unit. During the preparation of the AWP, a detailed estimate of the costs will be submitted.

Annual progress toward the completion of the Level II Survey should be documented and incorporated into this section. Only a summary of the work completed, including costs and MM's spent should be included. The actual Level II Survey will be kept in the library under 7210.2.

APPENDIX B. Long Term Gaging Stations

Long term gaging stations would be permanent type of gaging stations, and would also include water quality monitoring at these gages. These gages would be operated by USGS and be a part of their surface water monitoring system; although funds would be provided by BLM.

Presently BLM is funding some gages within the Rawlins District. These are indicated on the following table, and consituents monitored are also indicated. It is expected that these stations will continue to operate for several years.

New gages that are proposed are prioritized on the following table with reasons for establishment and constituents to be monitored.

Location Rawlins District	Existing (date estab.	Proposed (priority)	Upstream Activity	Level of Collection	Major Q[illegible]y. Determin[illegible]ns	Frequency
BIGHORN BASIN						
Bad water sub-basin 0361						
Dry Creek near Bonneville (06256900) T. 38 N., R. 92 W. Sec. 8	1976				1,2	M
Muskrat Creek sub-basin 0364						
Conant Creek 036403 T. 34 N., R. 93 W. Sec. 20		11	Oil and gas, grazing ES	b	2,6	W
Little Wind/Popo Agie sub-basin 0367						
Beaver Creek 036702 T. 1 S., R. 4 E., Sec. 29		10	Oil and gas, grazing	c	2,6	W
Beaver Creek 036702 T. 29 N., R. 98 W. Sec. 1		16	Grazing, recreation, minerals, fisheries	b	2,6	D
NORTH PLATTE BASIN						
North Platte at Saratoga 117100 T. 17 N., R. 84 W. Sec. 11		4	Grazing, logging, recreation, fisheries	c	2,6,9	D
Sweetwater River sub-basin						
Alkali Creek 115626 T. 29 N., R. 96 W. Sec. 14		8	Oil and gas, grazing	b	2,6	D
Crooks Creek 115617 T. 29 N., R. 92 W. Sec. 34		3	Uranium, oil and gas, grazing ES	b	2.6	D
Middle Cottonwood Creek 115614 T. 28 N., R. 91 W. Sec. 9		7	Uranium, logging, recreation grazing, fisheries	b	2,6	D
Big Creek sub-basin 1189						
Big Creek 118900 T. 14 N., R. 81 W. Sec. 20		15	Grazing ES	b	6	W
Sage Creek sub-basin 1175						
Sage Creek near Saratoga (06628800) T. 19 N., R. 85 W. Sec. 32	1972			b	2	M

Location Rawlins District (cont.)	Existing (date est	Proposed (priority)	Upstream Activity	Level of Collectio	Major [illegible]ty. Determinations	Frequ
St. Mary's Creek sub-basin 1172						
St. Mary's Creek 1172 T. 21 N., R. 85 W. Sec. 24		12	Coal, grazing	c	2,6	D
Big Ditch sub-basin 1169						
Big Ditch near Coyote Springs (06630300) T. 23 N., R. 83 W. Sec. 30	1974			b	1,2,8 4 5	M Q A
North Ditch near Coyote Springs (06630330) T. 23 N., R. 83 W. Sec. 19	1976			b	1,2,8 4 5	M Q A
Medicine Bow sub-basin 1168						
Second Sand Creek 116815 T. 21 N., R. 79 W. Sec. 12		17	Grazing, coal rehabilitation	a	2,6	I
Hanna Draw near Hanna (06634990) T. 24 N., R. 81 W. Sec. 34	1974			b	1,2,8 4 5	[illegible]
Spring Creek 116811 T. 28 N., R. 78 W. Sec. 25		13	Uranium mining, grazing	a	2,6,5	I
Austin Creek sub-basin 1167						
Austin Creek 116700 T. 25 N., R. 82 W. Sec. 32		9	Logging, recreation, grazing	b	2,6	I

Location Rawlins District (cont.)	Existing (date esta'	Proposed (priority)	Upstream Activity	Level of Collection	Major Q[illegible]y Determi[illegible]ns	Frequency
GREAT DIVIDE BASIN						
Separation Creek sub-basin 1307						
Separation Creek near Riner (09216527) T. 20 N., R. 90 W. Sec. 32	1975			b	1,2,6,8 4	M Q
Separation Creek at upper station near Riner (09216527) T. 19 N., R. 90 W. Sec. 9	1975				1,6	M
LITTLE SNAKE BASIN						
Little Snake River 140500 T. 12 N., R. 91 W. Sec. 5		6	Coal, oil and gas, grazing transbasin diversions, fisheries	c	2,6	D
Muddy Creek sub-basin 1407						
Muddy Creek 140700 T. 17 N., R. 89 W. Sec. 18		2	Oil and gas, grazing ES	b	2,6	D
Wild Cow Creek 140708 T. 15 N., R. 91 W. Sec. 8		14	Coal, oil and gas	a	2,6	D
Robbers Gulch 140704 T. 14 N., R. 92 W. Secs. 1, 2		19	Watershed improvements, grazing, oil and gas	b	6	W
Muddy Creek 140700 T. 13 N., R. 91 W. Sec. 4		1	Coal, oil and gas, grazing ES	c	2,6	D
Savery Creek sub-basin 1411						
Savery Creek 141100 T. 12 N., R. 89 W. Sec. 7		5	Coal, irrigation, logging, recreation, fisheries	b	2,6,9	D
Sand Creek sub-basin 1402						
Sand Creek 140200 T. 12 N., R. 93 W. Sec. 4		18	Grazing, oil and gas	a		

In the preceeding table, existing and proposed sites are listed by basin and sub-basin within the District. The four-digit sub-basin number (see "Hydrologic Unit Map") follows the sub-basin name. For proposed sites, the numbers following the site name are the six-digit hydrologic unit number, township, range, and section, respectively. For existing sites, the numbers following the site name are eight-digit USGS identification numbers in parentheses, township, range, and section, respectively.

The type and level of collection for each proposed station is designated by the letters (a), (b), and (c). Primary stations located on the river's main stem are designated by the letter (c), while stations upstream and downstream of a specific activity are designated by (a). In order that results be directly comparable between basins, it is important that data collected and frequency of collection be similar between (a) and (c). The letter (b) identifies stations at which data collected may be for specific purposes or at intervals different than (a) and (c).

The explanation of codes under "major quality determination" and "frequency" follows.

1. field determination of pH, electrical conductivity, dissolved oxygen, temperature, and/or turbidity
2. major ionic constituents (salinity)
3. bacteria (total coliform, fecal coliform and/or fecal streptococcus)
4. trace metals
5. radiochemical
6. sediment

7. total dissolved solids

8. nutrients

9. biochemical oxygen demand

10. electrical conductivity (alone)

11. particle size

D - daily

M - monthly

MV - monthly, vary with flow

V - varying

Q - quarterly

A - annual

HH - hydrograph during high flow periods. Reduced during low flow

HF - hydrograph during periods of flow

APPENDIX C Special Surveillance and Monitoring

The special studies and monitoring programs would be necessary because of actions which may need water resource interpretations of a level which is not possible from data gathered during Level II Reconnaissance Surveys and other data available.

One such monitoring program would be to monitor the effects of the change in grazing which has been proposed within the Seven Lakes Range E.S. The object would be to assess whether or not the proposed action affects water resources as identified in the E.S.

In the future, monitoring programs would also be necessary on any Watershed Activity Plans which are written. In some cases special studies may be necessary before the Watershed Activity Plan is done.

At present only one Watershed Activity Plan has been written within the District. This Plan is on Second Sand Creek a tributary of the Medicine Bow River. To moniter proposals of the Plan a monitering program should be undertaken in FY 1980. This would consist of a gaging station and an automatic sampler so water quality and sediment levels can be monitered. Reconnaissance would also be done at other locations on the streams to moniter the different areas of the drainage basin.

In FY 1979 a special study within the Big Horn River Drainage is needed to determine water needs for the water rights adjudication in Water District No. 3. This at present involves measuring all reservoir structures to determine surface water storage needs.

Also in FY 1979 Instream Flow Quantification Studies will be implemented in the Overland R.A. as part of the U.R.A. update effort. These determinations will be useful in filings for water rights in the future.

Flood plain mapping within the District needs to begin in FY 79 to follow new Manual requirements. These mapping efforts are likely to be separate from other monitering efforts such as Level II surveys. Thus they will fall into the special study category.

APPENDIX D Technical Guidelines

1. Will include a collection of all Instruction Memoranda which are applicable to the Water Resources Program in the Rawlins District (Reserved).

2. Method of using active channel geometry to determine flow characteristics (Reserved).

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
State Office
P. O. Box 1828
Cheyenne, Wyoming 82001

IN REPLY REFER TO
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February 1, 1979

Instruction Memorandum No. WY-79-153
Expires 9/30/80

To: District Managers, Chiefs, Divisions of Resources, P&EC, and TS

From: Associate State Director

Subject: Water Resources in the Environmental Analysis Process

To assure that the water resources are properly considered in evaluating a proposed action, the following topical items will be appropriately addressed in all future environmental analyses and statements. These items will also be used by the State Office in reviewing the contents of all environmental efforts.

The basic concern in the management of the water resources, as a result of a proposed action(s), is the impact or effect on any aspect or part of the hydrologic cycle. The concept of the environmental analysis document is to present information to decisionmakers. It is clear, when we review legislation and Executive policy impacting public land decisions, that our decisions must be open, well informed, and objective. How and why decisions were made and what the decision was must be well documented. That documentation must withstand scrutiny of all parties; therefore, the analysis should be presented in terms of significance of impact (area, timing, and duration), related consequences, and effects of proposed mitigating measures. The following items will be addressed dependent upon the proposed action and the alternatives outlined in the environmental assessment:

Water Quantity

1. A description of the surface water characteristics (storage, availability, location).

2. A description of the surface runoff characteristics (volume, distribution, frequency, timing).

3. Describe and analyze the effects the proposed action will have on the surface water system.

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4. Identify critical aquifers, as designated by the State Engineer, and other pertinent aquifers in and adjacent to the concerned area. Analyze the effects the proposed action will have on these aquifers (water movement, water table depth, etc.).

5. Describe and analyze what effects the proposed action will have on surface water-ground water relationships.

6. Identify what uses are occurring in the area. Analyze how these uses will be affected by the proposed action.

7. Describe what water sources are available for the water requirements of the proposed action. Analyze the effects these withdrawals will have on surface or ground water. Describe and analyze the secondary impacts occurring from the proposed action; i.e., increased consumptions due to increases in population in impacted communities outside the project area.

8. Describe and analyze any potential effects upon water quantity that would be additive or synergistic in nature when the proposed action is viewed as one of several operations within a larger drainage basin.

9. Identify and analyze any impacts upon surface and ground water appropriated or reserved water rights. Identify and analyze the effects the proposed action will have on instream flow needs for dependent resources; i.e., livestock, wildlife, aquatic habitat, water quality, etc. Identify any discharges associated with the project. Analyze the possibility that future water users will file for a water right on this increased discharge without knowing that the source of the water will be terminated in the future.

10. Identify whether or not proposed actions on any ancillary operations will encroach upon the base (100-year) or critical (500-year) flood plain and analyze the effects the proposed action will have on the flood plain.

11. Identify whether or not wetlands (riparian-aquatic habitat) will be affected by the proposed action. Analyze the significance of the effects of the operation on the wetlands habitat and the hydrologic aspects associated with the wetlands area.

12. Identify whether or not alluvial valley floors (AVF's) are involved. Discuss the direct or indirect effects the proposed action will have on the hydrologic functioning of these AVF's. Identify what potentials there are for restoration of the AVF's.

Water Quality

1. Describe the quality characteristics of surface and ground water and their suitabilities for domestic livestock, wildlife, and irrigation uses.

2. Analyze the effects the proposed action will have on surface and ground water quality in terms of violation of quality standards and uses; i.e., changes in sediment yield and erosions, chemical constituents, bacteriological contaminants, etc.

3. Analyze any potential effects upon water quality that would be additive or synergistic in nature when the proposed action is viewed as one of several operations within a larger drainage basin.

Future Environment

Describe and analyze the future hydrologic and climatic environments. It is important to remember that many resources (e.g., wildlife, fisheries, range, forestry, etc.) are dependent upon certain hydrologic and climatic variables. When observed in a time series, these variables may exhibit trends and/or cycles. If a trend in a given time series is sufficiently strong (and linear with no jumps in the mean or variance), the future environment may be significantly different from the present environment. A prediction of the change (from present to future) in those affected variables, or at least an indication of the probable direction of change, should be addressed.

Distribution

Director (412)	2
SCD (D-531)	3
WSO CF	2
EEO	1

Memorandum

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

IN REPLY REFER TO:
7152.2

Instruction Memorandum WY-039-78-7
(Expires: 9/30/79)

TO : Area Managers: Lander, Divide, Medicine Bow Date: SEP 01 1978

FROM : District Manager, Rawlins

SUBJECT : Response to DEQ Notification of Intent to Issue Wastewater Discharge Permits

Wyoming's Department of Environmental Quality (DEQ) periodically issues public notices stating intentions to issue wastewater discharge permits. These permits include wastewaters associated with oil and gas production as well as municipal and industrial (mining) discharges. To enable better comments by the Rawlins District on these proposed wastewater discharge permits (per I.M. WY-76-63 on Form 7240-1) the following procedures will be followed.

1. The District Hydrologist will coordinate the response effort by determining which Resource Areas are affected by proposed discharge permits. He will then request input from the affected Area(s).

2. Resource Areas will supply the District Hydrologist with any pertinent comments on the subject wastewater permit(s). This includes a statement of "no comment" if that is the case. If it is felt by the Area that an examination of the situation is necessary, then this examination shall be made by the Area or be requested to be made by whomever it is felt is qualified if the expertise is not within the Area.

3. The District Hydrologist will then assemble all comments from Areas into a District response to be filed with DEQ and WSO.

Fred Wolf

NBlakeslee:gjm - 8/30/78
Blakeslee

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

State Office
P. O. Box 1828
Cheyenne, Wyoming 82001

7318 (932)

November 22, 1976

Instruction Memo WY 76-63
Expires 6/30/77 12/31/77

To: District Managers

From: State Director, Wyoming

Subject: Waste Water Discharge Public Notice

The State of Wyoming's Public Noticesof Intent to Issue Waste Water Discharge Permits are to be responded to by the districts. A negative or no comment response is necessary.

Respond by submitting Form WY 7240-1 (forms attached) directly to the Department of Environmental Quality, Water Division, Hathaway Building, Cheyenne, Wyoming 82001. Please send a copy of your response to the State Director (932).

In the future, you will receive the Public Notice of Intent directly from DEQ, State of Wyoming.

Enclosure

Distribution
WO (412) - 2 (w/2 encl.)
DSC (D-531) - 3 (w/3 encl.)
WSO CF - 2 (w/2 encl.)

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APPENDIX E
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4. Some Statistical Tools in Hydrology.

5. Computation of Rate and Volume of Stream Depletion by Wells.
6. Introduction to Ground-Water hydraulics.
7. Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases.
8. Determination of Minor Elements in Water by Emission Spectroscopy.
9. Methods for Analysis of Organic Substances in Water.
10. Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples.
11. Laboratory Theory and Methods for Sediment.
12. Finite-Difference Model for Aquifer Simulation in Two Dimensions with Results of Numerical Experiments.
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APPENDIX F Glossary (Reserved)

Appendix G Work Accomplishments

FY 1978

I. Level II Reconnaissance Survey

A. The Level II Survey for the Overland ES area was started in the Muddy and Sage Creek drainages. Approximately 12 WMs were spent in the effort. Surface water data was collected which included yeild, conductivity, DO, pH, Turbidity, and bacteriological. Lab analysis of water was not accomplished due to loss of $5,000 after mid-year. 200 miles of stream was inventoried and reported. It is estimated that in 1979 25 WMs will be expended in completing another 650 miles of inventory. In FY 1980 about 5 WMs to complete and compile the survey will be necessary.

B. Data collected in the summer of 1977 for the Green Mountain ES area was assembled and submitted to Water Resources Research Institute for incorporation onto the Water Resources Data System (WRDS). 50 miles of stream were reported as a result of this effort.

C. Precipitation and climatic equipment were ordered and received and were to be installed in the Overland P. U. in early October 1978.

II. DSC Rainfall Simulator Project

The Rainfall Simulator was operated within the Green Mountain ES area in FY 78. The effort was supported by Rawlins District personnel with at least 1.4 WMs. More time was probably spent and coded to other work codes. Rawlins District provided aid in choosing sites, determining vegetative conditions, soil descriptions, and aided with logistical problems.

III. Sand Creek Watershed Plan

Approximately 2.5 WMs were expended in developing a watershed plan and EAR for Second Sand Creek in Medicine Bow Resource Area.

IV. District Water Management Plan

The Rawlins District Water Management Plan was drafted and sent out for review by WSO as well as by the District management. By the end of FY 78 it was not completed, but should be signed off in FY 79. About 1 WM was expended in the effort.

V. Training

A total of 1.3 WMs was expended in training of District personnel. The District Hydrologist attended a short course on Water Law, and also attended Water Quality Data Acquisition and Interpretation with

the Medicine Bow Resource Area Soil Scientist, and a Ground Water Techniques Course with the District Geologist.

VI. Water Division 3 Adjudication

Time for measurement of reservoirs in the Lander Resource Area within the Big Horn Drainage came from 8100 funds. About 15 WMs were expended for this effort. It is estimated that another 15 WMs are necessary to complete reservoir mapping in the Big Horn Drainage in 1979.

Total for 4340-5200 17.9 WMs expended

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